ERIC Documents Resume	See Instruction Sheet	DATE OF RESUME 9/21/65	DATE RECEIVED

A. PUBLICATION DATA

1. ERIC NUMBER	2. ORIGINATOR CONTROL NO(S).	3. IDENTIFICATION NO.
ED002202	N.A.	2461

DO NOT WRITE IN SPACE BELOW

4. AUTHOR(S): Woodward, John C.

5. TITLE OF DOCUMENT ABSTRACTED:
Attitude and Achievement Comparisons for Direct and Television Classes in Biological Science - Report 3

6. PUBLICATION TITLE: N.A.

7. EDITOR(S): N.A.

8. PLACE OF ORIGIN
ORG. Office for Study of Instruction, University
ST. College, University
CITY, STATE of Miami, Coral Gables, Fla.
TELE. EXT.
INST/LOC CODE

9. PUBLISHER OR SOURCE
University of Miami
Coral Gables, Florida

10. VOL.	11. PAGES	12. MO./YR.	13. TOTAL PP.
N.A.	N.A.	June 1964	30

MICROFILM COPY AVAILABLE
YES ☒ NO ☐

COPYRIGHT GRANTED
YES ☐ NO ☒

COPYRIGHT RELEASE FILED
YES ☐ NO ☐

TYPE OF REPORT
PROPOSAL ☐
IN-PROGRESS ☐
FINAL ☒
FOLLOW-UP ☐

OTHER ERIC REFERENCES:

ERIC SATELLITE CODE

B. INDEXING DATA

14. SUBJECT AREA

15. TYPE OF ENDEAVOR Report

16. INDEXING TERMS (6-12)	
college	student attitude
biological science	lecture method
television	attitudes
	achievement

17. ABSTRACT (MAX. 250 WORDS)

To determine which teaching method was more efficient, student attitude and student achievement were compared between television (TV) lectures and direct class lectures given by the same instructor and covering the same material.

The lecture group (126 students) had significantly greater numbers of upperclassmen; more of the students planned to study Education than Business Administration in later education. The TV group (543) had more males. There were no significant differences in other factors.

To test difference in attitude, an attitude scale was developed. Forms were filled out by the students and analyzed by a computer.

Achievement was evaluated by comparisons of scores on a midterm exam. The mean achievement for the direct lecture group was higher with a t ratio analysis indicating significant difference (.001 level). A final examination of 100 questions was also analyzed. Again, the mean difference was significantly different and favored the direct lecture group.

The direct lecture method was significantly superior to TV. As a result, biology classes (fall of 1964) were taught by direct lecture method with TV used only for special demonstrations.

ERIC No.

18. SOURCE OF ABSTRACT

C. FUNDING DATA

19. SUPPORTING ORGANIZATION	20. DIVISION OR DEPT.	21. CONTRACT NO. / PROJECT NO.
	22. TOTAL COST OF PROJECT	
	23. DURATION OF PROJECT	U.S. Department of Health, Education, and Welfare Office of Education

FICE FOR THE STUDY OF INSTRUCTION • UNIVERSITY COLLEGE • UNIVERSITY OF MIAMI • CORAL GABLES, FLORIDA
. ROBERT M. DIAMOND, DIRECTOR OF INSTRUCTIONAL RESOURCES DR. JOHN WALKER POWELL, DIRECTOR OF CURRICULUM STUDY DR. JOHN C. WOODWARD, DIRECTOR OF EVALUATION

2461
ED002202

ATTITUDE AND ACHIEVEMENT COMPARISONS FOR DIRECT AND TELEVISION CLASSES IN BIOLOGICAL SCIENCE

DETAILED REPORT
JOHN C. WOODWARD
JUNE, 1964

Report 3

SUPPORTED BY A GRANT FROM THE FUND FOR THE ADVANCEMENT OF EDUCATION

INSTRUCTIONAL TECHNOLOGY - U.S.C.
2461

ATTITUDE AND ACHIEVEMENT COMPARISONS FOR DIRECT AND TELEVISION CLASSES IN BIOLOGICAL SCIENCE

Detailed Report

John C. Woodward

June 1964

Report No. 3

Office for the Study of Instruction, University College, University of Miami, Coral Gables, Florida.

This study conducted under a grant from the Fund for the Advancement of Education.

Table of Contents

Introduction and Statement of the Problem 1

Method of Procedure 1

Analysis of Data and Results 1

Student Characteristics 1
Student Opinions 6
Student Achievement 18

Summary and Conclusions 19

Action Taken 20

List of Tables

Table	Title	Page
I	School and College Ability Test Means and Standard Deviations by Group	2
II	Grade Point Average by Group	2
III	Previous Natural Science Grades by Course and Group	3
IV	Intended Course of Study for Direct and TV Sections of Natural Science 201 (Biological Science)	3
V	Class Standing by Group	4
VI	Sex Characteristics by Group	4
VII	National Background by Group	5
VIII	Approximate Size of Senior High School Class	5
IX	The Use of Television in High School Class by Group	6
X	Analysis of Statement: This course is exceptionally well organized; subject matter in agreement with clearly defined course objectives	7
XI	Analysis of Statement: The examinations are fair tests of the course material.....	7
XII	Analysis of Statement: The grades in this course are based on very limited evidence of achievement	8
XIII	Analysis of Statement: A large percentage (over 25%) of the students in this class cheat in some way on examinations	9
XIV	Analysis of Statement: Natural science is an important area of study for anyone going to college	9
XV	Analysis of Statement: The assignments are not related well to the course objectives .	10

List of Tables - Con't

Table	Title	Page
XVI	Analysis of Statement: There is a detrimental lack of opportunity for personal attention in this course	10
XVII	Analysis of Statement: The lectures in this course are well organized; related well to course objectives, use of pertinent audio-visual materials, etc.	11
XVIII	Analysis of Statement: It is better to have TV lectures by the best possible natural science professors than regular classroom lectures by average professors	12
XIX	Analysis of Statement: The lectures in this course are easy to follow; understandable and clearly presented	12
XX	Analysis of Statement: A large portion of the students are not attentive during the lecture	13
XXI	Analysis of Statement: The lecturer in this course covers too much material in each lecture	13
XXII	Analysis of Statement: In general, the TV lectures are superior to regular in-class lectures	14
XXIII	Analysis of Statement: The methods of teaching used in this course are superior to methods used in my previous natural science courses	15
XXIV	Analysis of Statement: This course is very boring most of the time	15
XXV	Analysis of Statement: My general interest in this area of natural science has decreased as a result of my experience in this course	16

List of Tables - Con't

Table	Title	Page
XXVI	Analysis of Statement: It is better to have a lecture by a professor in the classroom than to have the same lecture by the same professor on TV	17
XXVII	Analysis of Statement: I much prefer to have one lecturer in a course than to have two	17
XXVIII	Analysis of Statement: The University College curriculum (course of studies) provides a broad integrated intellectual experience for students	18
XXIX	Analysis of Statement: The attitude of most University College students is very negative toward the teaching methods used in University College	18
XXX	Means and Standard Deviations Direct and TV Groups comparison Unit Exam	19
XXXI	Means and Standard Deviations for Identical Final Exam Questions	19

Introduction and Statement of the Problem

During the first semester of the 1963-64 academic year Natural Science 201, the first semester of biological science, was offered both by direct teaching (instructor in the classroom) and by television lecture. The one direct teaching section was offered at the 8:00 o'clock hour in the morning and the TV lecture sections, three in number, were offered at 10:00 A.M. The direct lecture was given by Dr. Margaret J. Mustard; the TV lectures were given by Dr. Robert H. Williams and Dr. Mustard.

The investigation was conducted to answer the following questions:

1) What is the student attitude in the direct taught section as compared to the TV sections?

2) What is the difference in achievement as measured by classroom exams between the direct and TV sections?

Method of Procedure

To test the difference in attitude between the two groups, an attitude scale was developed. (Appendix A) The scale was administered to the students in all sections ten days prior to final examinations for the first semester. Student answers were key punched into IBM cards for computer analysis.

To evaluate the achievement differential between the direct taught group and the TV group, both were given identical instruction (same lectures, material, etc.) except that the TV group received the instruction via TV and the direct group directly in the classroom. Identical exams were administered to both groups and analyzed as one achievement criterion.

The final examination contained one hundred questions. Fifty of these questions were over material taught identically, except for TV, to both groups. These fifty questions were analyzed for differences as a second achievement criterion.

Analysis of Data and Results

Student Characteristics

Table I is a report of the scholastic aptitude of the groups as measured by the School and College Ability Test, SCAT.

TABLE I

School and College Ability Test Means
and Standard Deviations by Group

Group	School and College Ability Test					
	Verbal		Quantitative		Total	
	Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.
Direct	47.44	28.85	46.80	26.72	46.76	28.02
Television	50.20	27.89	52.17	26.31	50.27	26.85

To test the significance of the difference in the means between groups reported in Table I, analysis of t was used. The mean differences for the verbal, quantitative, and total are not significant. The t ratios are .6601, 1.379, and .8640 for verbal, quantitative, and total score in that order.

To test differences that might exist in studentship between the two groups, previous grade point average was recorded and checked. These findings are contained in Table II.

TABLE II

Grade Point Average
by Group

Group	Grade Point Average	
	Mean	Std.Dev.
Direct	1.377	.5659
Television	1.311	.5488

A t analysis revealed no significant difference in the means reported in Table II.

REPRINTED BY PERMISSION
U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN PRINTED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

The grades earned in previous natural science courses were thought to be a factor which could influence the criterion measures. Previous grades in natural science courses were checked for analysis. The result of this computation is reported in Table III.

TABLE III

Previous Natural Science Grades
by Course and Group

Group	Natural Science Course			
	Physical Science 1		Physical Science 2	
	Mean	Std.Dev.	Mean	Std.Dev.
Direct	2.016	.975	2.250	.749
Television	2.125	.873	2.096	.886

t analysis demonstrated no significant difference in the mean previous natural science grades for these groups.

Table IV is a summary of the expressed course of study for the two groups.

TABLE IV

Intended Course of Study for Direct and TV
Sections of Natural Science 201
(Biological Science)

Course of Study	Direct		Television	
	N(126)	%	N(543)	%
Arts & Sciences	46	37	193	36
Business Administration	28	22	200	37
Education	43	34	127	23
Engineering	0	0	2	0
Other	9	7	21	4

Chi square analysis indicates a significant difference between the two groups for the intended course of study in the areas of Business Administration and Education. Significantly more of the direct taught students intend to go into Education and significantly fewer into Business Administration than do the TV students.

A report of class standing of the groups is reported in Table V.

TABLE V

Class Standing by Group

Group	Freshman		Sophomore		Junior		Senior	
	N	%	N	%	N	%	N	%
Direct	13	10	77	61	29	23	7	6
Television	81	15	381	70	63	12	18	3

The percent of upper classmen in the direct section is significantly greater than in the TV section.

Table VI is a summary of the sex characteristics of the two groups.

TABLE VI

Sex Characteristics by Group

Sex	Direct		Television	
	N	%	N	%
Male	60	47	344	63
Female	66	53	199	37

Chi square analysis reveals that the percentage of males in the television group is significantly greater than is the percentage of males in the direct group.

The national background of the two groups was analyzed and the report of this analysis is found in Table VII.

TABLE VII

National Background by Group

Group	National Background					
	United States		Cuba		Other	
	N	%	N	%	N	%
Direct	117	93	6	5	3	2
Television	517	95	12	2	14	3

The influence of national background other than United States is not significant.

Table VIII depicts the size of the senior high school class of the two groups.

TABLE VIII

Approximate Size of Senior High School Class

Group	Size of Senior High School Class									
	Less than 50		50 - 100		100 - 200		200 - 300		300 +	
	N	%	N	%	N	%	N	%	N	%
Direct	13	10	11	9	22	17	15	12	65	52
Television	55	10	76	14	86	16	76	14	250	46

No significant difference exists between the two groups. The majority of both groups comes from the larger high schools.

A summary of the use of television in the high school classes of the groups is given in Table IX.

It is obvious that television was not used to any great extent in the high school classes of these students.

TABLE IX

The Use of Television in High School Class by Group

Group	Use of Television in High School					
	Not used		Occasionally		Regularly	
	N	%	N	%	N	%
Direct	101	80	16	13	9	7
Television	408	75	76	14	59	11

Student Opinions

In answering the opinionaire, the students were given the following instructions:

Directions: Student opinion or attitude is a very important part of the evaluation of the educational program in University College. This opinionaire is anonymous, please be frank and honest with your responses. After a few preliminary questions you will find a series of generalizations, principles or ideas about the course in which you are now enrolled. You may or may not agree with them; or you may support some more strongly than others. Please circle the rating for each item which seems to be the one representing more closely your point of view or belief with respect to it. In making your rating, use the following symbols:

If you strongly agree with the statement circle	SA
If you simply agree with the statement circle	A
If you are uncertain; have no opinion either way circle	U
If you disagree with the statement circle	D
If you strongly disagree with the statement circle	SD

Please answer all questions.

Chi square analysis was used to determine whether or not the opinion of students in each category was significantly different from chance and to test the significance of the differences between the two groups, direct and TV.

The result of the analysis for statement number 8 is reported in Table X.

TABLE X

Analysis of Statement: This course is exceptionally well organized; subject matter in agreement with clearly defined course objectives.

Method	Agree %			No Opinion %	Disagree %		
	SA	A	Tot.		D	SD	Tot.
Direct	48	44	92	5	0	3	3
Television	7	45	52	10	10	28	38

SA = strongly agree, A = simply agree, Tot. = total
D = simply disagree, SD = strongly disagree

Chi square analysis reveals the following:

1) The direct group agrees significantly over disagree.

2) The TV group agrees significantly over disagree.

3) The direct group agrees to this item in a significantly greater proportion than the TV group, 92% vs. 52%.

Table XI is a summary of the findings for item 9 of the opinionaire.

TABLE XI

Analysis of Statement: The examinations are fair tests of the course material.

Method	Agree %			No Opinion %	Disagree %		
	SA	A	Tot.		D	SD	Tot.
Direct	40	48	88	4	2	6	8
Television	8	44	52	13	12	23	35

Statistical analysis of the material reported in Table XI results in the following information:

1) Direct taught students agree to this statement significantly over disagree, .001 level of confidence.

2) The TV group agrees to this item significantly over disagree.

3) The direct group agrees to this statement to a degree that is significantly greater than the TV group, 88% to 52%.

The findings for item 10, grades, are reported in Table XII.

TABLE XII

Analysis of Statement: The grades in this course are based on very limited evidence of achievement.

Method	Agree %			No Opinion %	Disagree %		
	SA	A	Tot.		D	SD	Tot.
Direct	10	17	27	17	16	40	56
Television	20	35	55	15	4	26	30

Analysis of the opinions of the two groups for this statement indicates the following:

1) The direct group disagrees significantly with this statement.

2) The TV group agrees significantly with the statement.

3) The TV group agrees significantly over the direct group concerning this item.

In Table XIII the findings regarding item 11 are reported.

TABLE XIII

Analysis of Statement: A large percentage (over 25%) of the students in this class cheat in some way on examinations.

Method	Agree %			No Opinion %	Disagree %		
	SA	A	Tot.		D	SD	Tot.
Direct	5	5	11	51	11	27	38
Television	9	15	24	45	12	19	31

The statistical analysis of the material in Table XIII reveals the following:

1) The "no opinion" for both groups is the significant factor.

The general statement concerning the importance of natural science, item 12, is analyzed in Table XIV.

TABLE XIV

Analysis of Statement: Natural science is an important area of study for anyone going to college.

Method	Agree %			No Opinion %	Disagree %		
	SA	A	Tot.		D	SD	Tot.
Direct	13	50	63	15	7	15	22
Television	14	37	51	12	14	23	37

Statistical findings for item twelve are as follows:

1) Both groups agree to this statement significantly over their disagreement with it.

2) The direct group feels significantly stronger about it, however, than does the TV group.

Summary information for item number 13 is reported in Table XV.

TABLE XV

Analysis of Statement: The assignments are not related well to the course objectives.

Method	Agree %			No Opinion %	Disagree %		
	SA	A	Tot.		D	SD	Tot.
Direct	1	4	5	4	29	62	91
Television	4	12	16	16	12	56	68

The findings concerning this item are as follows:

1) Both groups disagree with this item significantly.

2) The direct group disagrees with it significantly more than the TV group.

Table XVI refers to information about item number 14 on the opinionaire.

TABLE XVI

Analysis of Statement: There is a detrimental lack of opportunity for personal attention in this course.

Method	Agree %			No Opinion %	Disagree %		
	SA	A	Tot.		D	SD	Tot.
Direct	12	30	42	12	12	34	46
Television	32	34	66	10	4	20	24

The analysis of the information contained in Table XVI may be summarized as follows:

1) The direct group does not disagree significantly more than it agrees to this item.

2) The TV group does agree significantly more than it disagrees.

3) The TV group agrees significantly more than does the direct group.

Question number 15 was analyzed for differences between the two groups. The findings are reported in Table XVII.

TABLE XVII

Analysis of Statement: The lectures in this course are well organized; related well to course objectives, use of pertinent audio-visual materials, etc.

Method	Agree %			No Opinion %	Disagree %		
	SA	A	Tot.		D	SD	Tot.
Direct	53	42	95	1	1	3	4
Television	11	51	62	8	10	20	30

The information in Table XVII was analyzed with the following results:

1) The direct and television group both agree significantly with this statement.

2) The direct group agrees significantly more than the TV group, 95% vs. 62%.

Table XVIII is a report of the results for item number 16.

The findings are as follows:

Although the TV group agrees to this item somewhat over the direct group, the interesting factor is the split between agree and disagree for both groups.

TABLE XVIII

Analysis of Statement: It is better to have TV lectures by the best possible natural science professors than regular classroom lectures by average professors.

Method	Agree %			No Opinion %	Disagree %		
	SA	A	Tot.		D	SD	Tot.
Direct	17	21	38	15	22	25	47
Television	21	27	48	12	18	22	40

The item concerned with lectures (17) is treated in Table XIX.

TABLE XIX

Analysis of Statement: The lectures in this course are easy to follow; understandable and clearly presented.

Method	Agree %			No Opinion %	Disagree %		
	SA	A	Tot.		D	SD	Tot.
Direct	39	51	90	6	0	4	4
Television	4	29	33	11	27	29	56

Findings:

1) The 90% agree for the direct group is highly significant.

2) The 56% disagree for the TV group is significant.

3) The 90 to 33 percent difference between the groups for the agreement category is significant.

A report of the responses to item number 18 is given in Table XX.

TABLE XX

Analysis of Statement: A large portion of the students are not attentive during the lecture.

Method	Agree %			No Opinion %	Disagree %		
	SA	A	Tot.		D	SD	Tot.
Direct	2	21	23	20	9	48	57
Television	35	43	78	11	2	9	11

Chi square analysis:

1) The direct group disagrees in a significant way to this statement.

2) The TV group agrees significantly to the lack of attention problem.

3) The TV group agrees significantly over the direct group.

Item number 19 on the opinionaire is analyzed in Table XXI.

TABLE XXI

Analysis of Statement: The lecturer in this course covers too much material in each lecture.

Method	Agree %			No Opinion %	Disagree %		
	SA	A	Tot.		D	SD	Tot.
Direct	5	7	12	8	17	63	80
Television	14	28	42	19	1	38	39

Findings from Table XXI:

1) The direct group is definite in its opinion here. Eighty percent do not agree with the statement.

2) There is no real difference between the agree and disagree for the TV group.

3) The TV agreement is significantly greater than that of the direct group.

Statistics for item number 20 are reported in Table XXII.

TABLE XXII

Analysis of Statement: In general, the TV lectures are superior to regular in-class lectures.

Method	Agree %			No Opinion %	Disagree %		
	SA	A	Tot.		D	SD	Tot.
Direct	1	7	8	18	40	34	74
Television	6	19	25	19	29	27	56

Results:

1) The majority of both groups do not agree that TV lectures are superior to in-class lectures. These are significant percentages.

2) The percent of disagreement of the direct group is greater than that of the TV group.

Item number 21 was analyzed. A summary of this analysis is reported in Table XXIII.

Findings from Table XXIII:

1) A significant majority of the direct group agree with the statement.

TABLE XXIII

Analysis of Statement: The methods of teaching used in this course are superior to methods used in my previous natural science courses.

Method	Agree %			No Opinion %	Disagree %		
	SA	A	Tot.		D	SD	Tot.
Direct	28	31	59	26	2	13	15
Television	5	17	22	31	18	29	47

2) A less than chance minority agree with the statement in the TV group.

3) The direct group agree to a significant degree over the TV concerning this item.

To item 22 on the opinionaire the students responded as indicated in Table XXIV.

TABLE XXIV

Analysis of Statement: This course is very boring most of the time.

Method	Agree %			No Opinion %	Disagree %		
	SA	A	Tot.		D	SD	Tot.
Direct	1	13	14	7	27	52	79
Television	28	34	62	10	2	26	28

Findings:

1) The direct students disagree to a significant percent.

2) The TV students agree to a significant percent.

3) The TV group agrees with the statement significantly over the direct group.

Table XXV contains information for item 23.

TABLE XXV

Analysis of Statement: My general interest in this area of natural science has decreased as a result of my experience in this course.

Method	Agree %			No Opinion %	Disagree %		
	SA	A	Tot.		D	SD	Tot.
Direct	3	9	12	8	28	52	80
Television	14	22	36	18	9	37	46

1) The area of disagreement for the direct group is highly significant.

2) The TV group also disagrees significantly.

3) The direct group disagrees to a significant degree over the TV group.

Item 24 is presented and analyzed in Table XXVI.

Findings:

1) Both groups agree in a significant way to this item.

2) The agreement of the direct group is greater than the TV group.

The analysis of item number 25 is summarized in Table XXVII.

TABLE XXVI

Analysis of Statement: It is better to have a lecture by a professor in the classroom than to have the same lecture by the same professor on TV.

Method	Agree %			No Opinion %	Disagree %		
	SA	A	Tot.		D	SD	Tot.
Direct	60	28	88	6	0	6	6
Television	39	30	69	13	3	15	18

TABLE XXVII

Analysis of Statement: I much prefer to have one lecturer in a course than to have two.

Method	Agree %			No Opinion %	Disagree %		
	SA	A	Tot.		D	SD	Tot.
Direct	43	29	72	17	1	10	11
Television	15	19	34	22	10	34	44

Findings:

1) The direct group is definite about their preference for one instructor.

2) As compared to the direct group, the TV group is significantly more in favor of two lecturers.

For questions number 26, Table XXVIII is a summary.

The analysis resulted in the following findings:

1) Both groups agree to this statement. The TV group is more positive than the direct group, but not significantly.

TABLE XXVIII

Analysis of Statement: The University College curriculum (course of studies) provides a broad integrated intellectual experience for students.

Method	Agree %			No Opinion %	Disagree %		
	SA	A	Tot.		D	SD	Tot.
Direct	15	44	59	18	9	14	23
Television	13	52	65	15	8	12	20

The item concerned with general attitude (27) is analyzed in Table XXIX.

TABLE XXIX

Analysis of Statement: The attitude of most University College students is very negative toward the teaching methods used in University College.

Method	Agree %			No Opinion %	Disagree %		
	SA	A	Tot.		D	SD	Tot.
Direct	23	40	63	25	2	10	12
Television	26	36	62	26	1	11	12

The findings for item 27 are as follows:

1) The majority of both groups agree to this statement to a significant degree.

Student Achievement

Comparisons were made between the two groups on a mid-term exam. Both the direct taught group and the TV group received the

lectures from the same instructor and the same examination. Table XXX is a report of the results of this examination.

TABLE XXX

Means and Standard Deviations Direct and TV Groups Comparison Unit Exam.

Group	Unit Exam	
	Means	Std.Dev.
Direct	75.75	14.9
Television	70.23	15.3

As noted in Table XXX, the mean achievement for the direct group is higher than that of the TV group. A t ratio analysis indicates that this difference is significant .001 level.

The final examination was analyzed for differences between the groups. Fifty of the items on this exam covered material taught by the same instructor to both groups. These means are reported in Table XXXI.

TABLE XXXI

Means and Standard Deviations for Identical Final Exam Questions.

Group	Final Exam Questions	
	Means	Std.Dev.
Direct	35.632	8.428
Television	32.770	8.674

The mean difference reported in Table XXXI is significantly different and favors the direct group.

Summary and Conclusions

Comparisons made for attitude and achievement between two classes of biological science, one direct teaching and one television

teaching, indicates that the attitude and achievement of the direct taught group is significantly better than the TV group.

It must be concluded from these findings that within the framework of the methods investigated[1] the direct method is significantly superior to the TV method.

It is recommended that the TV lecture courses as it is now structured be eliminated. One of two courses of action could be followed. All sections could use the direct method of instruction using television only where it serves as the best means of presenting material to students, or the television course should be completely redesigned in close coordination with experts in the field of educational television production. If the second course of action is followed, it would be necessary to continue at least one direct section as a control group for the evaluation.

Action Taken

As a result of the findings of this research, all biological science classes will be taught by the direct method next fall. Television will be used for special demonstration presentations to all sections and where it is felt by the classroom instructor that television is the best means of presenting the material.

---

[1]Dr. Robert M. Diamond raises some questions concerning the quality of instructional television at the University of Miami in Report No. 6, "Progress Report on Instructional Television."

APPENDIX A

University College Student Opinionaire

DIRECTIONS: Student opinion or attitude is a very important part of the evaluation of the educational program in University College. This opinionaire is anonymous, please be frank and honest with your responses. After a few preliminary questions you will find a series of generalizations, principles or ideas about the course in which you are now enrolled. You may or may not agree with them; or you may support some more strongly than others. Please circle the rating for each item which seems to be the one representing more closely your point of view or belief with respect to it. In making your rating use the following symbols:

If you strongly agree with the statement circle ..... SA
If you simply agree with the statement circle ..... A
If you are uncertain; have no opinion either way circle ... U
If you disagree with the statement circle ..... D
If you strongly disagree with the statement circle ..... SD

Please answer all questions.

1. Intended course of study: (check appropriate space)

Arts and Sciences _____
Business Administration _____
Education _____
Engineering _____
Other (please state) _____

2. Class standing (check one):

Freshman (less than 28 credit hrs.) _____
Sophomore (28 to 59 credit hrs.) _____
Junior (60 to 89 credit hrs.) _____
Senior (90 or more credit hrs.) _____

3. Sex:

Male _____
Female _____

4. National background (check one):

United States _____
Cuba _____
Other (please state) _____

5. Approximate size of your senior high school class (check one):

Less than 50	_____
50 - 100	_____
100 - 200	_____
200 - 300	_____
300 or more	_____

6. Television was used in your high school classes (check one):

Not used	_____
Occasionally	_____
Regularly	_____

7. Based on the exams you have had so far what is the best estimate of your present grade in this course (check one):

A (90 - 100)	_____
B (80 - 89)	_____
C (70 - 79)	_____
D (60 - 69)	_____
E (59 and below)	_____

As indicated before, rate the statements that follow in this way:

Circle: SA if you <u>strongly agree</u>
A if you <u>simply agree</u>
U if <u>uncertain</u>; no opinion
D if you <u>disagree</u>
SD if you <u>strongly disagree</u>

8. This course is exceptionally well organized; subject matter in agreement with clearly defined course objectives:

SA A U D SD

9. The examinations are fair tests of the course material:

SA A U D SD

10. The grades in this course are based on very limited evidence of achievement:

SA A U D SD

11. A large percentage (over 25%) of the students in this class cheat in some way on examinations:

SA A U D SD

12. Natural science is an important area of study for anyone going to college:

SA A U D SD

13. The assignments are not related well to the course objectives:

SA A U D SD

14. There is a detrimental lack of opportunity for personal attention in this course:

SA A U D SD

15. The lectures in this course are well organized; related well to course objectives, use of pertinent audio-visual materials, etc.:

SA A U D SD

16. It is better to have TV lectures by the best possible natural science professors than regular classroom lectures by average professors:

SA A U D SD

17. The lectures in this course are easy to follow; understandable and clearly presented:

SA A U D SD

18. A large portion of the students are not attentive during the lecture:

SA A U D SD

19. The lecturer in this course covers too much material in each lecture:

SA A U D SD

20. In general the TV lectures are superior to regular in-class lectures:

SA A U D SD

21. The methods of teaching used in this course are superior to methods used in my previous natural science courses:

SA A U D SD

22. This course is very boring most of the time:

SA A U D SD

23. My general interest in this area of natural science has decreased as a result of my experience in this course:

SA A U D SD

24. It is better to have a lecture by a professor in the classroom than to have the same lecture by the same professor on TV:

SA A U D SD

25. I much prefer to have one lecturer in a course than to have two:

SA A U D SD

26. The University College curriculum (course of studies) provides a broad integrated intellectual experience for students:

SA A U D SD

27. The attitude of most University College students is very negative toward the teaching methods used in University College:

SA A U D SD